

Notice of Allowability

Application No.

09/738,979

Examiner

Timothy L Rude

Applicant(s)

UMEMOTO ET AL.

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to appeal brief filed 20 January 2004.
2. ☒ The allowed claim(s) is/are 1-19.
3. ☒ The drawings filed on 20 December 2000 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 20040414.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

tlr

DETAILED ACTION

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Attorney Christopher R Lipp on 13 April 2004.

The application has been amended as follows:

Claims 1 and 4-6 are amended to read:

1. A liquid-crystal display device comprising: a transmission type liquid-crystal display panel including a liquid crystal cell; a light source disposed on at least one side surface of said liquid-crystal display panel, wherein light emitted from said light source exclusively enters substrates of said liquid-crystal display panel and layers therebetween; and an optical path changing sheet disposed on a back side, opposite to a visual side, of said liquid-crystal display panel and having optical path changing

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slopes by which incident light from said light source is reflected toward said visual side of said liquid-crystal display device.

4. A liquid-crystal display device according to claim 1, wherein said [liquid-crystal display panel further includes cell] substrates [for supporting] support said liquid-crystal cell, and said [cell] substrates [being] are made of an optically isotropic material.

5. A liquid-crystal display device according to claim 4, wherein said optical path changing sheet has optical path changing slopes each inclined at an inclination angle in a range of from 35 to 48 degrees with respect to a sheet plane, said optical path changing sheet is bonded to said liquid-crystal display panel through an adhesive layer so that a slope forming surface of said optical path changing sheet is located on said back side opposite to said visual side of said liquid-crystal display panel, and a refractive index difference is not larger than 0.15 between said optical path changing sheet and one of said [cell] substrates nearest to said optical path changing sheet.

6. A liquid-crystal display device according to claim 5, wherein the refractive index difference is not larger than 0.10 between said optical path changing sheet and said nearest [liquid-crystal cell] substrate, and a refractive, index difference is not larger than 0.15 between said adhesive layer and said nearest [liquid-crystal cell] substrate.

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Allowable Subject Matter

Claims 1-19 are allowed.

The following is an examiner's statement of reasons for allowance:

As to claim 1, relevant prior art of record did not disclose, alone or in combination, a liquid-crystal display device as claimed comprising: a transmission type liquid-crystal display panel including a liquid crystal cell; a light source disposed on at least one side surface of said liquid-crystal display panel, wherein light emitted from said light source **exclusively** enters substrates of said liquid-crystal display panel and layers therebetween; and an optical path changing sheet disposed on a back side, opposite to a visual side, of said liquid-crystal display panel and having optical path changing slopes by which incident light from said light source is reflected toward said visual side of said liquid-crystal display device.

The closest combination is Yuuki et al (Yuuki) USPAT 6,147,725 in view of Mizumo et al (Mizumo) USPAT 6,285,420 who teach a transmission type liquid-crystal display panel including a liquid crystal cell; a light source disposed on at least one side surface of said liquid-crystal display panel, wherein light emitted from said light source enters substrates of said liquid-crystal display panel, layers therebetween, and a light guide disposed outside one of the substrates; and an optical path changing sheet disposed on a back side, opposite to a visual side, of said liquid-crystal display panel and having optical path changing slopes by which incident light from said light source is reflected toward said visual side of said liquid-crystal display device.

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The instant invention provides a brightly illuminated display without the use of a light guide external to the display substrates.

As to claims 2-19, they are directly or indirectly dependent upon claim 1 with allowable subject matter above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

References cited but not applied are relevant to the instant Application.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Monday through Thursday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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Timothy L Rude
Examiner
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DUNG T. NGUYEN
PRIMARY EXAMINER